Name:

Date:

For problems #1 – 5, simplify the expression. No negative exponents should be remaining. All denominators should be rationalized. (3pts. each)

1.    
     
     
     
     
     
     
     
     
     
     
     
   2. 



4.

5.

6. Which function displays the fastest growth as the *x*-values continue to increase? (2pts)  
 

a) *f(x)*

b) *g(x)*

c) *h(x)*

d) *d(x)*

Without graphing, identify if the following functions represent

**exponential growth** or **exponential decay**. (2pts each)

7.  8.  9. 

10. Complete the table for . Then graph the function below. (3pts)

|  |  |
| --- | --- |
| *x* | *f(x)* |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

11. Identify the domain and range of the exponential function . (2pts)

12. Compare the graph of the parent function, , to the graph of. Describe how the graph has shifted. (3pts)

13. Rewrite  so that it contains only two transformations of the function . (3pts)

14. A car is purchased for $30,000. The value of the car depreciates annually so that it is $24,000 after 1 year; $19,200 after 2 years; and $15,360 after 3 years. Write a function to model the value of this car after *y* years. (3pts)

16. Which situation represents exponential growth over time? (3pts)

a) The number of ants in a population that increases by 1,000 ants each day.

b) The temperature of a glass of water that increases by 10 degrees every half hour until it reaches

room temperature.

c) The number of people who go to a play if each person who sees the play returns the next evening

and brings 2 friends.

d) The size of a population of bacteria that increases by 1,000 in the first hour, then by 1,000 during

the next two hours, then by 1,000 during the next 4 hours, and continues to grow according to

the same pattern.

Solve for *x* in problems 16 – 20. (4pts each)

16.  = *x*

17. x =

18.

19.

20.